

REMARKS

Reconsideration of the above-identified application in view of the present amendment is respectfully requested.

The applicants acknowledge with appreciation, the allowance of claims 3 and 5, in the indication of the allowability of claims 12-17. Claims 3 and 5 are maintained in their allowable condition. Allowable claims 12-17 are amended to address the clarity items set forth on pages 2 and 3 of the Office action. Accordingly, it is believed that claims 12-17 are in condition for allowance. Also, claims 4 and 11 are amended to address clarity issues in addition to amendments to claims 1 and 2.

Turning to the rejection of claims 1, 2, 4, and 11 in view of Park (U. S. Patent No. 5,910,693) and Suzuki et al. (U. S. Patent No. 5,508,578, hereinafter referred to as "the Suzuki Patent"), the rejection is respectfully traversed.

Focusing for the moment on claim 1, is to be appreciated that in order to improve the heat radiation characteristic of a stator by making the heat conduction from a stator core to a mounting plate better, a rising portion is provided on a side of an inner peripheral portion of a mounting plate, and an annular portion of the stator core is fixed directly onto the rising portion. In distinction, the approach set forth by the Park patent does not include provision of a rising portion on the side on an inner peripheral portion of the mounting plate and fixing of an annular portion of the stator core directly onto the rising portion. The Office action states that Park discloses a rising portion being provided on a side of an inner peripheral portion of a mounting plate. In particular, the Office action draws attention to Fig. 4 of the Park patent. However, as is actually provided in the motor of Fig. 1-4 of the Park patent, the stator core is mounted on the mounting plate 1 through a collar, which is made from a different member from the mounting plate, without providing the rising portion on the side of the inner peripheral portion of the mounting plate. Since the different member lies between the mounting plate and the stator core within the park device,

Claim 4 recites as necessary conditions that the annular portion of the stator core is mounted directly on top of the rising portion of the mounting plate and that the annular portion of the stator core, the inner peripheral portion of the mounting plate, and the flange of the boss are tightened by screws extending there through.

Again, it is to be appreciated that neither the Park patent nor the Suzuki patent provide for such claim features. Therefore, claim 4 is allowable.

Claim 11 recites that the annular portion of the stator core is fixed directly onto the rising portion of the inner periphery of the mounting plate. However, neither the Park patent or the Suzuki patent provide for such structural features. Therefore, even in combination of the teachings provided by the Park and Suzuki patents would not provide the present invention as set forth in claim 11. Accordingly, claim 11 is allowable.

In view of the foregoing, it is respectfully submitted that the above-identified application is in condition for allowance and allowance for the above-identified application is respectfully requested.

If there are any fees resulting from this communication, please charge all uncovered fees to our Deposit Account No. 16-0820, our Order No. 34175.

Respectfully submitted,
PEARNE & GORDON LLP

By 
Ronald M. Kachmarik, Reg. No. 34512

526 Superior Avenue East
Suite 1200
Cleveland, Ohio 44114-1484
(216) 579-1700

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such a configuration cannot defectively perform the heat conduction from the stator core to the mounting plate.

The Suzuki patent does not provide for the deficiencies of the Park patent. Specifically, the Suzuki patent discloses that a boss is formed resin mold. However, there is no description regarding fixing the stator directly onto the mounting plate within the Suzuki patent. In the motor of the Suzuki patent, the resin mold portion is provided so as to fully cover the annular portion of the stator core, and the stator core is attached to the mounting plate through the resin mold portion. Therefore, the Suzuki patent does not show a configuration which enables a person of skill in the art to fix the stator core directly onto the mounting plate.

Assuming, arguendo, that the device of the Park patent is modified in view of the teachings provided by the Suzuki patent, it should be appreciated that the stator core is mounted on the mounting plate through the resin mold portion. It is impossible for a combination of teachings provided by the Park and Suzuki patents to provide a configuration of the present invention such that a boss is formed of resin mold and more over the stator core is fixed directly onto the mounting plate. Accordingly, it is respectfully submitted that claim 1 is allowable in view of both Park and Suzuki.

Turning attention to claim 2, it is to be appreciated that the claimed invention is directed to a presence of an annular rising portion being integrally inserted into the boss and also that the annular portion of the stator is fixed directly to the face at the top of the rising portion.

In distinction, neither the Park patent nor the Suzuki patent mentions such structural features. Therefore, even a combination of the teachings provided by the Park and Suzuki patents would not provide the present invention as set forth in claim 2. Therefore, claim 2 is allowable.

Version showing marked-up changes

Title: "OUTER ROTOR TYPE BRUSHLESS MOTOR"

Serial No.: 09/990,125

Our Docket No.: 34175

1 1. (Amended) An outer rotor type brushless motor comprising an outer rotor
2 having permanent magnets fixed onto an inner periphery of a cup-like rotor yoke, a
3 stator including a stator core having a plural of magnetic pole portions protruded on
4 an outer periphery of an annular portion of said stator core and faced to said
5 permanent magnets and coils wound on said magnetic pole portions, respectively, a
6 cylindrical boss disposed on an inner periphery of said annular portion of said stator
7 core, a rotational shaft extending along an axis of said boss and rotationally
8 supported on said boss by a bearing with a leading end of said shaft having a center
9 portion of said rotor yoke fixed thereto and a mounting plate fixed onto an outer
10 periphery of said boss, a rising portion being provided on the side of an inner
11 peripheral portion of said mounting plate so as to form at the top of said rising
12 portion a face parallel to the face of said inner peripheral portion, said boss being
13 formed of resin mold and extending through a hole in said mounting plate and fixed
14 thereto and said annular portion of said stator core being fixed [by screw to the top
15 of said rising portion] directly to the top of said rising portion by screw.

1 2. (Amended) An outer rotor type brushless motor comprising an outer rotor
2 having permanent magnets fixed onto an inner periphery of a cup-like rotor yoke, a
3 stator including a stator core having a plural of magnetic pole portions protruded on
4 an outer periphery of an annular portion of said stator core and faced to said
5 permanent magnets and coils wound on said magnetic pole portions, respectively, a
6 cylindrical boss disposed on an inner periphery of said annular portion of said stator
7 core, a rotational shaft extending along an axis of said boss and rotationally
8 supported on said boss by a bearing with a leading end of said shaft having a center
9 portion of said rotor yoke fixed thereto and a mounting plate fixed onto an outer
10 periphery of said boss, said boss being formed of resin mold, an annular rising
11 portion being formed on the side of an inner peripheral portion of said mounting
12 plate so as to form at the top of said rising portions a face parallel to the face of said

13 inner peripheral portion, said annular rising portion being integrally inserted into said
14 boss so as to be fixed thereto when said boss is molded and said annular portion of
15 said stator core being mounted on and fixed [by screw to said face at the top of said
16 rising portion] directly to said face at the top of said rising portion by screw.

1 4. (Amended) An outer rotor type brushless motor comprising an outer rotor
2 having permanent magnets fixed onto an inner periphery of a cup-like rotor yoke, a
3 stator including a stator core having a plural of magnetic pole portions protruded on
4 an outer periphery of an annular portion of said stator core and faced to said
5 permanent magnets and coils wound on said magnetic pole portions, respectively, a
6 cylindrical boss disposed on an inner periphery of said annular portion of said stator
7 core, a rotational shaft extending along an axis of said boss and rotationally
8 supported on said boss by a bearing with a leading end of said shaft having a center
9 portion of said rotor yoke fixed thereto and a mounting plate fixed onto an outer
10 periphery of said boss, said boss being formed or resin mold, a flange being
11 protruded on the outer periphery of said boss, an annular rising portion being
12 provided on the side of an inner periphery of said mounting plate, an annular
13 peripheral portion provided at the top of said rising portion and having a face parallel
14 to said mounting plate being mounted on said flange of said boss, said annular
15 portion of said stator core being mounted [on said] directly on an inner peripheral
16 portion at the top of said rising portion, and said annular portion of said stator core,
17 said inner peripheral portion of said mounting plate and said flange of said boss
18 being tightened by screws extending through them.

1 11. (Amended) An outer rotor type brushless motor comprising an outer
2 rotor having permanent magnets fixed onto an inner periphery of a cup-like rotor
3 yoke, a stator including a stator core having a plural of magnetic pole portions
4 protruded on an outer periphery of an annular portion of said stator core and faced
5 to said permanent magnets and coils wound on said magnetic pole portions,
6 respectively, with coil insulation layers provided between said magnetic pole portions
7 and said coils, respectively, a cylindrical boss disposed on an inner periphery of said
8 annular portion of said stator core, a rotational shaft extending along an axis of said

9 boss and rotationally supported on said boss by a bearing with a leading end of said
10 shaft having a center portion of said rotor yoke fixed thereto and a mounting plate
11 fixed onto an outer periphery of said boss, said boss being formed of resin mold,
12 said annular portion of said stator core being inserted into an outer periphery of said
13 boss so as to be fixed thereto, said coil insulation layers of said stator core being
14 formed of resin mold, said annular portion of said stator core being fixed directly to a
15 rising portion provided on the inner periphery of said mounting plate and said boss
16 and said coil insulation layers being integrally formed.

1 12. (Amended) An outer rotor type brushless motor comprising an outer
2 rotor having permanent magnets fixed onto an inner periphery of a cup-like rotor
3 yoke, a stator including a stator core having a plural of magnetic pole portions
4 protruded on an outer periphery of an annular portion of said stator core and faced
5 to said permanent magnets and coils wound on said magnetic pole portions,
6 respectively, a cylindrical boss disposed on an inner periphery of said annular
7 portion of said stator core, a rotational shaft extending along an axis of said boss
8 and rotationally supported on said boss by a bearing with a leading end of said shaft
9 having a center portion of said rotor yoke fixed thereto and a mounting plate fixed
10 onto an outer periphery of said boss, said boss being formed of resin mold, said
11 annular portion of said stator core being inserted into an outer periphery of said boss
12 so as to be fixed thereto when said boss is molded, said annular portion of said
13 stator core being fixed to a rising portion provided on the inner periphery of said
14 mounting plate, [an annular rising portion being provided on said mounting plate,] a
15 hole being provided in said rising portion forming an inner peripheral portion at the
16 top of said rising portion, a plural of radial slots being provided in said inner
17 peripheral portion around said hole, said annular portion of said stator core being
18 integrally inserted into said boss at ribs so as to be supported by said ribs of said
19 boss at said slots of said mounting plate and said annular portion of said stator core
20 being fixed to said inner peripheral portion of said mounting plate.

1 13. (Amended) An outer rotor type brushless motor comprising an outer
2 rotor having permanent magnets fixed onto an inner periphery of a cup-like rotor

3 yoke, a stator including a stator core having a plural of magnetic pole portions
4 protruded on an outer periphery of an annular portion of said stator core and faced
5 to said permanent magnets and coils wound on said magnetic pole portions,
6 respectively, with coil insulation layers provided between said magnetic pole portions
7 and said coils, respectively, a cylindrical boss disposed on an inner periphery of said
8 annular portion of said stator core, a rotational shaft extending along an axis of said
9 boss and rotationally supported on said boss by a bearing with a leading end of said
10 shaft having a center portion of said rotor yoke fixed thereto and a mounting plate
11 fixed onto an outer periphery of said boss, said boss being formed of resin mold,
12 said annular portion of said stator core being inserted into an outer periphery of said
13 boss so as to be fixed thereto, said coil insulation layers of said stator core being
14 formed of resin mold, said annular portion of said stator core being fixed to a rising
15 portion provided on the inner periphery of said mounting plate, [an annular rising
16 portion being provided on said mounting plate] a hole being provided in said rising
17 portion forming an inner peripheral portion at the top of said rising portion, a plural of
18 radial slots being provided in said inner peripheral portion around said hole, said
19 annular portion of said stator core being integrally inserted into said boss at ribs so
20 as to be supported by said ribs of said boss at said slots of said mounting plate and
21 said annular portion of said stator core being fixed to said inner peripheral portion of
22 said mounting plate.

1 14. (Amended) An outer rotor type brushless motor comprising an outer
2 rotor having permanent magnets fixed onto an inner periphery of a cup-like rotor
3 yoke, a stator including a stator core having a plural of magnetic pole portions
4 protruded on an outer periphery of an annular portion of said stator core and faced
5 to said permanent magnets and coils wound on said magnetic pole portions,
6 respectively, with coil insulation layers provided between said magnetic pole portions
7 and said coils, respectively, a cylindrical boss disposed on an inner periphery of said
8 annular portion of said stator core, a rotational shaft extending along an axis of said
9 boss and rotationally supported on said boss by a bearing with a leading end of said
10 shaft having a center portion of said rotor yoke fixed thereto and a mounting plate
11 fixed onto an outer periphery of said boss, said boss being formed of resin mold,

12 said annular portion of said stator core being inserted into an outer periphery of said
13 boss so as to be fixed thereto, said coil insulation layers of said stator core being
14 formed of resin mold, said annular portion of said stator core being fixed to a rising
15 portion provided on the inner periphery of said mounting plate, said boss and said
16 coil insulation layers being integrally formed, [an annular rising portion is provided on
17 said mounting plate,] a hole being provided in said rising portion forming an inner
18 peripheral portion at the top of said rising portion, a plural of radial slots being
19 provided in said inner peripheral portion around said hole, said annular portion of
20 said stator core being integrally inserted into said boss at ribs so as to be supported
21 by said ribs of said boss at said slots of said mounting plate and said annular portion
22 of said stator core being fixed to said inner peripheral portion of said mounting plate.

1 15. (Amended) An outer rotor type brushless motor comprising an outer
2 rotor having permanent magnets fixed onto an inner periphery of a cup-like rotor
3 yoke, a stator including a stator core having a plural of magnetic pole portions
4 protruded on an outer periphery [on an outer periphery] of an annular portion of said
5 stator core and faced to said permanent magnets and coils wound on said magnetic
6 pole portions, respectively, a cylindrical boss disposed on an inner periphery of said
7 annular portion of said stator core, a rotational shaft extending along an axis of said
8 boss and rotationally supported on said boss by a bearing with a leading end of said
9 shaft having a center portion of said rotor yoke fixed thereto and a mounting plate
10 fixed onto an outer periphery of said boss, said boss being formed of resin mold and
11 having ribs integrally protruded from the outer periphery thereof, said annular portion
12 of said stator core being inserted into an outer periphery of said boss so as to be
13 fixed thereto when said boss is molded, said annular portion of said stator core
14 being fixed to a rising portion provided on the inner periphery of said mounting plate,
15 a hole being provided in said mounting plate, a plural of rising portions being
16 intermittently provided on an inner peripheral portion around said hole in a
17 circumferential direction, core supports being provided at the tops of said rising
18 portions in parallel to said inner peripheral portion, said annular portion of said stator
19 core being mounted on said core supports and said annular portion of said stator
20 core being inserted into an outer periphery of said boss when said boss is molded

21 so as to be supported by said ribs above said inner peripheral portion between
22 adjacent rising portions.

1 16. (Amended) An outer rotor type brushless motor comprising an outer
2 rotor having permanent magnets fixed onto an inner periphery of a cup-like rotor
3 yoke, a stator including a stator core having a plural of magnetic pole portions
4 protruded on an outer periphery of an annular portion of said stator core and faced
5 to said permanent magnets and coils wound on said magnetic pole portions,
6 respectively, with coil insulation layers provided between said magnetic pole portions
7 and said coils, respectively, a cylindrical boss disposed on an inner periphery of said
8 annular portion of said stator core, a rotational shaft extending along an axis of said
9 boss and rotationally supported on said boss by a bearing with a leading end of said
10 shaft having a center portion of said rotor yoke fixed thereto and a mounting plate
11 fixed onto an outer periphery of said boss, said boss being formed of resin mold and
12 having ribs integrally protruded from the outer periphery thereof, said annular portion
13 of said stator core being inserted into an outer periphery of said boss so as to be
14 fixed thereto, said coil insulation layers of said stator core being formed of resin
15 mold, said annular portion of said stator core being fixed to a rising portion provided
16 on the inner periphery of said mounting plate, a hole being provided in said
17 mounting plate, a plural of rising portions being intermittently provided on an inner
18 peripheral portion around said hole in a circumferential direction, core supports
19 being provided at the tops of said rising portions in parallel to said inner peripheral
20 portion, said annular portion of said stator core being mounted on said core supports
21 and said annular portion of said stator core being inserted into an outer periphery of
22 said boss when said boss is molded so as to be supported by said ribs above said
23 inner peripheral portion between adjacent rising portions.

1 17. (Amended) An outer rotor type brushless motor comprising an outer
2 rotor having permanent magnets fixed onto an inner periphery of a cup-like rotor
3 yoke, a stator including a stator core having a plural of magnetic pole portions
4 protruded on an outer periphery of an annular portion of said stator core and faced
5 to said permanent magnets and coils wound on said magnetic pole portions,

6 respectively, with coil insulation layers provided between said magnetic pole portions
7 and said coils, respectively, a cylindrical boss disposed on an inner periphery of said
8 annular portion of said stator core, a rotational shaft extending along an axis of said
9 boss and rotationally supported on said boss by a bearing with a leading end of said
10 shaft having a center portion of said rotor yoke fixed thereto and a mounting plate
11 fixed onto an outer periphery of said boss, said boss being formed of resin mold and
12 having ribs integrally protruded from the outer periphery thereof, said annular portion
13 of said stator core being inserted into an outer periphery of said boss so as to be
14 fixed thereto, said coil insulation layers of said stator core being formed of resin
15 mold, said annular portion of said stator core being fixed to a rising portion provided
16 on the inner periphery of said mounting plate, said boss and said coil insulation
17 layers being integrally formed, a hole being provided in said mounting plate, a plural
18 of rising portions being intermittently provided on an inner peripheral portion around
19 said hole in a circumferential direction, core supports being provided at the tops of
20 said rising portions in parallel to said inner peripheral portion, said annular portion of
21 said stator core being mounted on said core supports and said annular portion of
22 said stator core being inserted into an outer periphery of said boss when said boss is
23 molded so as to be supported by said ribs above said inner peripheral portion
24 between adjacent rising portions.